CNS/ATM for Naval Aviation

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Purpose

This newsletter provides information to the Naval aviation community on civil initiatives in Communications, Navigation and Surveillance / Air Traffic Management (CNS/ATM).

NAVIGATION

RVSM Implementation

The global spread of Reduced Vertical Separation Minimum (RVSM) is continuing. RVSM is the reduction in vertical separation between aircraft from 2000 ft to 1000 ft between flight level 290 to flight level 410. To participate, an aircraft shall be equipped with:

- two independent cross-coupled altitude measuring systems (barometric),
- an altitude reporting transponder,
- an altitude alerting system (± 300 feet/ uncertainty of 50 feet), and
- an automatic altitude control system (± 65 feet).

Most civil aviation authorities have exempted military aircraft from meeting these requirements. However, this exemption does not mean that military aircraft may not be excluded or delayed due to safety or traffic conditions.

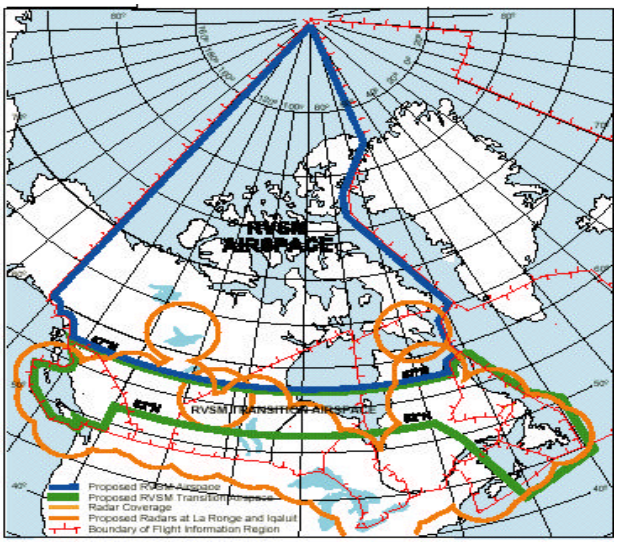
Up until recently, most RVSM implementations took place in oceanic airspace. With implementations scheduled for Australia in November and Europe in January, RVSM enters a new over land phase.

Australia will become the first continent to go RVSM. On 1 November 2001, Australia intends to implement RVSM in their airspace between FL290 and FL410. The oceanic airspace under their control will rise to FL410. This will be on a non-exclusionary basis.

Europe will become the second continent to go RVSM. The European Air Traffic Management Program office finished safety case assessments at the end of May. The safety case showed that all RVSM Safety Objectives would be met by the target implementation date. On 12 July 2001, the EUROCONTROL Provisional Council decided to implement on the target date of 24 January 2002.

Forty states will begin implementation on that date. The map below shows the RVSM area. A Military Guidance document for the Introduction of RVSM in Europe is available at www.eur-rvsm.com. In addition, Belarus will also implement RVSM in the Minsk Flight Information Region on 24 January 2002.

In northern Canada, RVSM implementation is scheduled to begin on 18 April 2002. The map below shows the RVSM area.



RVSM will cover FL290 to FL410. The southern Canadian airspace is expected to transition to RVSM when the US implements RVSM.

In the US, the FAA aims for a December 2004 start for Domestic RVSM (DRVSM). A Memorandum of Understanding between the FAA and DOD is in the final phase of negotiations. The FAA will accommodate non-compliant military aircraft while DOD pledges to bring its aircraft into compliance as soon as possible. The FAA plans to initiate a notice of proposed rulemaking in 2002. Initially, FL330 to FL390 will be covered expanding to FL290 through FL410 in later stages. The Gulf of Mexico will also be included.

China, including Hong Kong, will defer implementation of RVSM until 31 October 2002. Previously, the date was 21 February 2002.

RVSM Implementation

Location	Flight Levels	When
North Atlantic	FL330-370	27 March 1997
North Atlantic	FL310-390	8 October 1998
North Atlantic (Ireland, UK, France sectors)	FL290-410	19 April 2001
Pacific (Oceanic Airspace)	FL290-390	24 February 1999
Pacific (Dense Airspace)	FL290-390	24 February 2000
Pacific (all airspace)	FL290-410	October 2000
Western Atlantic Route System	FL290-410	1 November 2001
Australia	FL290-410	1 November 2001
Europe	FL290-410	24 January 2002
North Atlantic (all sectors)	FL290-410	24 January 2002
South Atlantic	FL290-410	24 January 2002
Western Pacific and South China Sea (except China and Hong Kong)	FL290-410	21 February 2002
Canada (Northern routes)	FL290-410	18 April 2002
China and Hong Kong	FL290-410	31 October 2002
Mid East	TBD	2003
Russian Federation	TBD	2004 ?
Gulf of Mexico	FL290-390	December 2004
CONUS	FL330-390	December 2004
Canada (Southern routes)	FL330-390	December 2004
CONUS	FL290-410	TBD
Asia (Mid East to West Pakistan)	TBD	TBD (Planning under way)

Most regions and countries implementing RVSM also plan to monitor the height keeping performance of aircraft in their airspace. The concern is that errors in altimetry systems may cause unsafe conditions. Currently, none of the areas with RVSM has monitored performance over extended periods. Until enough data is collected, there is uncertainty regarding the stability of the average altimetry system error.

DISPLAYS

Implementation considerations

An enabler of CNS/ATM is a cockpit display. Current and planned functions require that the pilot be able to access text or graphical information. These include such things as Controller to Pilot Data Link Communications (CPDLC) text messages, an alert of Required Navigation Performance (RNP) integrity loss, an alert of RVSM deviation, and graphical Automatic Dependent Surveillance - Broadcast (ADS-B) data as Cockpit Display of Traffic Information (CDTI). Also some planned graphical implementations such as weather maps (current, forecast, and dynamic storm cell location prediction), surface movement maps (showing "hot" taxiways and runways to prevent incursions), and route planning maps, including waypoints and Special Use Airspace, will require displays.

While some platforms may choose implementations such as (text) retinal projection or Heads Up Displays, most will opt for a multi-function display. To some extent, the size of the "glass" depends upon the available real estate in the cockpit, and the instruments replaced, if any.

A factor to consider in selecting a display is the use of Night Vision (NVIS) equipment. While color displays may seem to be the best choice, NVIS goggles causes the eye to see various shades of gray. In addition, display ambient lighting may interfere with NVIS.

Other factors to consider include both clarity (crispness of the text), and the fidelity of displayed information. In addition, the location in the field of view and the viewing angle impact the selection. The time to display the information versus the time the information is displayed needs to be considered. Finally, the relative priorities of the all of the information being displayed are a consideration.

CNS/ATM NEWS

2002 PMA-209 Users Conference

The 2002 PMA-209 Users Conference is scheduled for 4 through 8 February 2002 at the Bahia Hotel in San Diego, CA. Speakers will discuss the latest in avionics that advance both mission and safety functionality in military aircraft. Equipment exhibits and ask the experts are among the planned activities. Plan on attending. For information on registering, check the PMA-209 website at http://pma209.navair.navy.mil about two months before the conference